

PrimeFocus



WHEN:

December 16, 2022
 Set Up at 6:30pm
 Dinner at 7:00pm

WHERE:

Unitarian Church
 1893 North Vasco Rd.
 Livermore, CA 94551

TVS QR Code



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Tri-Valley Stargazers 2022 Winter Solstice Pot Luck Dinner December 16: 6:30pm Set Up, Dinner at 7pm

The winter Solstice Pot Luck Dinner will be held at the Unitarian Church. The main course, provided by the club, will consist of turkey and tri-tip. Attendees are requested to bring a side dish to feed 8. Based on the first letter of your last name, the suggestions are:

A-D: Macaroni, Potato, Green, or Fruit Salad

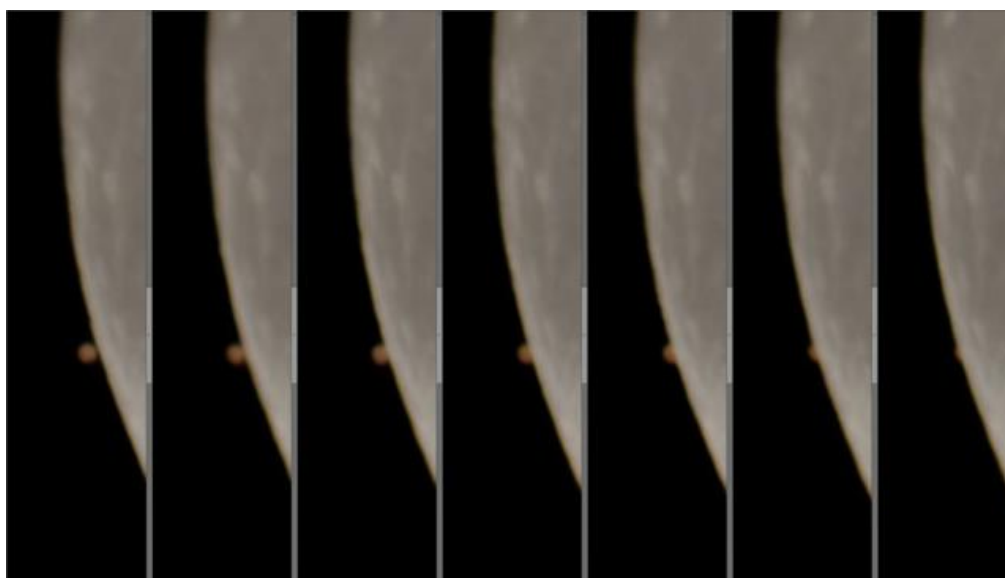
E-J: Vegetable or Beans

K-O: Appetizer

P-Z: Dessert

Come get reacquainted with your fellow club members!

December 7 Mars Occultation by the Moon



Caption: David Wright used a SkyMax 127mm refractor (1500 mm FL) and Pentax K-70 to capture this nice sequence of Mars ingress as it was occulted by the Moon.

Numerous club members observed and/or imaged the Mars Occultation. Additional occultation pictures are on p.5 of this newsletter.

Here in Flagstaff, Karen and I were fortunate to see the occultation. Virtually all day the sky was filled with clouds, but they parted a few minutes before Mars ingress. I observed the occultation through my Canon 12 x 36 Image-Stabilized binoculars and Karen was imaging the eclipse with her Sony camera (APS-C size chip) and 200mm lens (300mm full frame equivalent). I called out 1st, 2nd, 3rd, and 4th contact so she was able to trigger exposures to capture the gradual disappearance and reappearance of Mars. For me, the best view was during and after the reemergence of Mars. Fast moving clouds of varying density returned. Moving to the east, the motion of the clouds gave the impression that the Moon was racing upward in the field of view. It was a surreal experience that I won't soon forget.

Mars will once again be occulted by the Moon on January 30, 2023. It will be visible from the southwest US and southern CA. It might be especially interesting to seek out a location to see a grazing occultation.

News and Notes

2022-2023 Meeting Dates

Lecture Meeting	Board Meeting	PrimeFocus Deadline
Dec. 16	Dec. 19	
Jan. 20	Jan. 23	Jan. 6
Feb. 17	Feb. 20	Feb. 3
Mar. 17	Mar. 20	Mar. 3
Apr. 21	Apr. 24	Apr. 7
May 19	May 22	May 5
Jun. 16	Jun. 19	Jun. 2
Jul. 21	Jul. 24	Jul. 7
Aug. 18	Aug. 21	Aug. 4
Sep. 15	Sep. 18	Sep. 1
Oct. 20	Oct. 23	Oct. 6
Nov. 17	Nov. 20	Nov. 3
Dec. 15	Dec. 18	Dec. 1

Money Matters

As of the last Treasurer's Report on 11/21/22, our club's account balance is \$67,064.60. This includes \$43,127.90 in the H2O Rebuild fund.

TVS Election Results

TVS results are as follows:

President: Ron Kane

Vice-President: Eric Dueltgen

Treasurer: John Forrest

As of the election, no candidate came forward to run for the Secretary position. However, post-election, Dave Lackey volunteered to be the TVS Secretary for 2023. Given that we were past the election, the TVS Board approved the appointment of Dave to this critical club position. Thank you, Dave, for stepping forward to serve the club.

TVS Welcomes New Members

TVS welcomes new members David Hammons and Keethi Valluru. Please say hello and chat with them during our meetings.

Time to Renew Club Membership for 2023

Now is a great time to become part of TVS. Membership is open to anyone with an interest in astronomy. Amateurs and professionals are equally welcome; skilled amateurs comprise the majority of the membership. You do not have to own a telescope in order to be a member.

Those renewing their club membership are encouraged to do so by using the online application before the end of December. Normally our memberships are only good for the calendar year, but anyone joining after October 1st will be given a membership for the remainder of 2022 and all of 2023.

The regular club membership remains a bargain at \$30. Student membership (full-time High School or College student) is only \$10! To become a key holder to H2O, you must be 18 or older. There is a one-time \$20 Key deposit and a \$10 annual access fee.

You can join TVS or renew your membership online at: <http://www.trivalleystargazers.org/membership.shtml> After filling out the application form you are connected to the PayPal payment form. You do not need to have a PayPal account to pay online, since PayPal will accept credit cards. Everyone is encouraged to use the online application. Alternatively, you can mail in the Membership Application on the last page of this newsletter along with a check to the Tri-Valley Stargazers, P.O. Box 2476, Livermore, CA 94551-2476. Note that TVS will not share your information with anyone. We only use the e-mail address to notify you when the newsletter becomes available.

All members agree to hold the Tri-Valley Stargazers, and any cooperating organizations or landowners, harmless from all claims of liability for any injury or loss sustained at a TVS function.

2022 and 2023 Club Star Party Schedule

Save the dates for the 2022 Club Star Parties.

Del Valle star parties are also public outreach events. They are jointly hosted with the EBRPD and held at the Arroyo Staging Area. The public is invited for the first 1.5-2 hours, while club members can stay the remainder of the night.

Tesla Vintners star parties are open to only club members and their guests. These star parties end at midnight, but participants can leave earlier, should they wish.

H2O Open House star parties are open to the public. The open house ends at midnight, and all participants are encouraged to stay the duration. The drive to H2O takes about 1 hour, and the caravan leaves promptly from the corner of Mines and Tesla Rds. No gas stations are available on the route, so be prepared. Admission is \$3/car-bring exact change. H2O is a primitive site with two porta-potties. Bring water, food, and warm clothing, as needed. Red flashlights are to be used so observers can preserve their night vision.

December 21: Mendenhall Middle School, 1701 El Padro Drive, Livermore. Set up at 6:00pm in conjunction with concert, Observing 6:45-8:00pm

January 18: Livermore Elementary School, 2451 Portola Ave, Livermore. Family Science Night. Set up at 5:00pm, Observing 6:00-8:00pm

February 23: Arroyo Seco Elementary School, 5280 Irene Way, Livermore. Family Science Night. Set up at 5:00pm, Observing 6:00-8:00pm

Calendar of Events

December 14, 1:00pm-2:00pm

What: JWST: Impressive First Science One Year After Launch

Who: Dr. Susan Mullally (SETI) and Dr. Chris Evans (ESA Office at STSci)

Sponsor: SETI Institute

Online: REGISTRATION REQUIRED

<https://www.eventbrite.com/e/seti-talks-jwst-impressive-first-science-one-year-after-launch-tickets-478553575627>

The James Webb Space Telescope (JWST) was successfully launched on December 25, 2021. Following the commissioning of the telescope and its instruments, the first science observations started in late June. On July 12, 2022, the world saw its spectacular first images. From December 12-14, astronomers from around the world will gather at the Space Telescope Science Institute in Baltimore, Maryland, USA (STSci), the science and operations center for JWST, for a science conference to highlight the first scientific results from NASA's newest Great Observatory.

To discuss the impressive results in four science themes: the Early Universe, Galaxy Assembly, Stellar and Planetary Lifecycles, and Other Worlds, SETI Institute Senior Astronomer Franck Marchis will be in Baltimore to moderate a special SETI Talk with two astronomers involved in JWST science and operations. Susan Mullally, STSci, is an astronomical time series data expert and has used these skills to study the population of exoplanets, variable stars and binary stars. Mullally works to ensure the scientific productivity of NASA's space telescopes. Chris Evans, head of the European Space

Agency (ESA) office at STSci, serves as ESA project scientist for Hubble and Webb guest observers.

For more information, see: <https://www.seti.org/talks>

December 17, 1:00pm-2:00pm

What: Investigation Space: Water on the Moon

Who: Chabot Staff

Where: Chabot Space and Science Center, 10000 Skyline Blvd. Oakland, CA 94619

Cost: Free with General Admission. Adult \$24, Kids/Seniors/Students \$19

Scientists are always curious to find water in the furthest reaches of the Earth and the Moon. Today's program will span the freezing waters underneath Antarctica to the ice on the Moon.

Is there water on the Moon? We're about to find out with the upcoming mission of NASA's Prime-1 lunar project. Before Artemis astronauts land on the Moon in 2024, robots will scout the surface for resources and collect information about the lunar South Pole. Some landers and rovers will come equipped with handy tools, including drills and chemical analyzers, to examine what lies below the lunar surface. Hear from the team who is planning this mission.

The Polar Resources Ice Mining Experiment-1 (PRIME-1) will be the first in-situ resource utilization demonstration on the Moon. Additionally, for the first time, NASA will robotically sample and analyze for ice from below the surface.

continued on p.4

Officers

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TVS E-Group

To join the TVS e-group just send an email message to TVS at: info@trivalleystargazers.org asking to join the group. Make sure you specify the e-mail address you want to use to read and post to the group.

Calendar of Events (con't)

We will also be showing a documentary about the mysterious lake under Antarctica after the talk:

The Lake at the Bottom of the World:

The feature-length science documentary, *The Lake at the Bottom of the World*, follows a team of researchers as they explore the uncharted surface of the Antarctic continent 3,600 feet beneath the ice to reveal buried truths about our planet's dynamic past.

After the presentation, stick around and learn about the pH of Dry Ice. This engaging demonstration illustrates how chemical signatures can tell us what something is made of, whether it's frozen water or frozen carbon dioxide (dry ice)!

For more information, see:

<https://chabot.space.org/events/events-listing/>

February 6, 7:30pm

What: Unveiling a Dark Universe: from Tiny Galaxies to

Cosmic Maps

Who: Dr. Risa Wechsler (Stanford University)

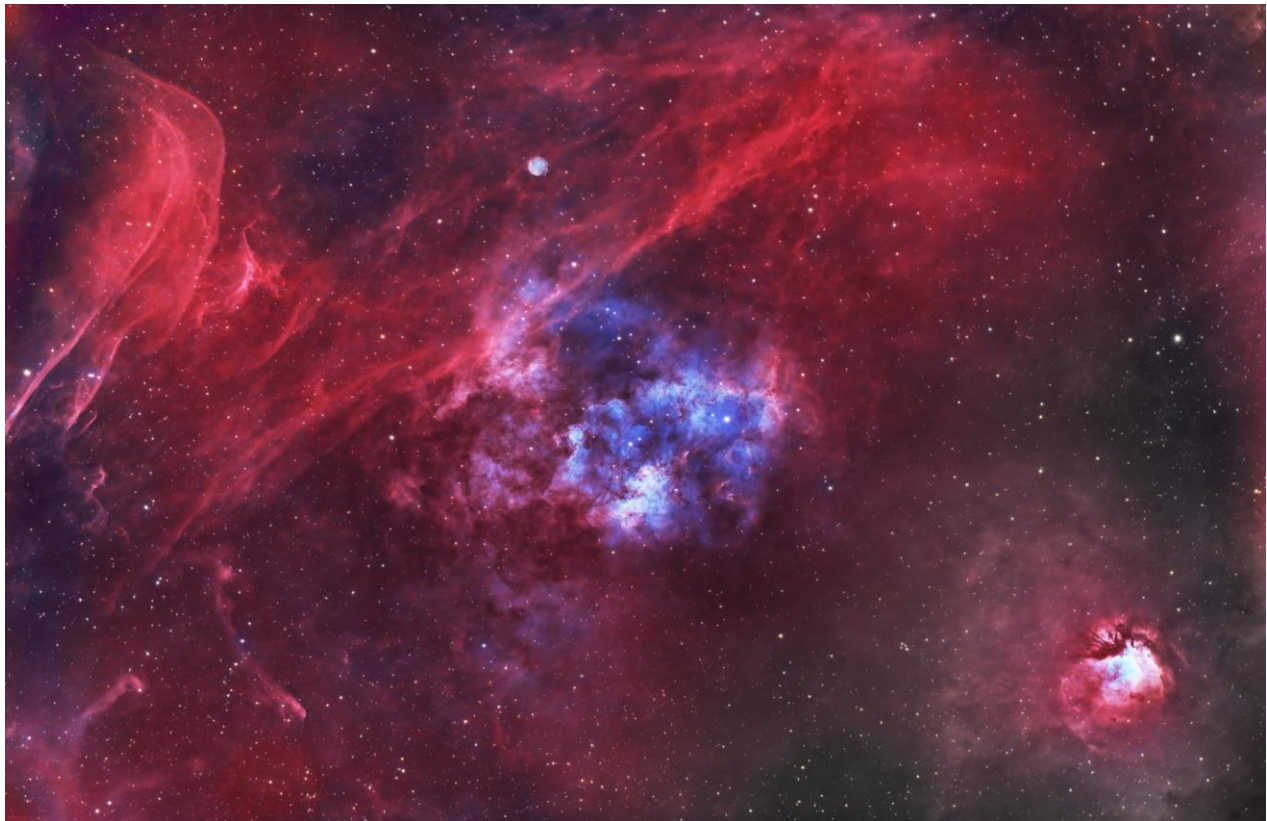
Where: Golden Gate Park, 55 Music Concourse Drive, San Francisco

Cost: Members and Seniors \$12, Guests \$15

The Universe is dominated by a mysterious, unseen substance known as dark matter, which makes up more than eighty percent of the cosmos. In recent decades, much has been learned about dark matter, including its density and spatial distribution, but its fundamental nature — for example, what kind of particle it is, how massive it is, and how it interacts — remains largely unknown. This lecture will explain how tiny galaxies, measurements of distorted spacetime, and the largest maps of the cosmos are giving us insights into the nature of dark matter, and will describe the enormous discovery potential provided by the next decade of cosmic surveys.

For more information, see: [Benjamin Dean Astronomy Lecture](#)

TVS Astrophotography By Moe Yassine



Caption: Moe Yassine imaged SH2-115 for 33.5 hours from his backyard in San Ramon. The image is presented in the Hubble Pallet (SHO), however I've changed the color balance again to bring it back to the natural colors given that both Sulfur and Hydrogen are in the red section of the spectrum. The idea here was to collect the sulfur to bring out the additional detail in the structures, however have the colors be more natural. The full resolution image and details of acquisition can be found at: www.astrobin.com/full/4xy7st/0/

TVS Astrophotography: Mars Occultation



Caption: Gert Gottschalk imaged the Mars Occultation from the parking lot of his apartment complex. He used a 6" Schmidt-Cassegrain telescope with a 2.5x barlow and an ASI224MS camera. Taken just prior to ingress, surface details of Mars are visible.



Caption: Jenny Siders imaged the emergence of Mars from Livermore using her iPhone 13 attached to her SkyMax 102mm refractor (left). Karen Harris imaged the emergence of Mars from Flagstaff, AZ using her Sony digital camera and zoom lens set to 200mm (300mm full frame equivalent; right). Mars emerged from two different locations on the Moon's limb owing to the different perspectives from the disparate locations.

What's Up

By Ken Sperber (adapted from S&T)

All times are Pacific Standard Time

December

- 13-14 Tue- The Geminid Meteor Shower peaks the morning of the 14th
14 Wed The Moon is $\sim 4^\circ$ to the upper left of Regulus (Morning)
16 Fri Last-Quarter Moon (12:56am)
18 Sun The Moon is separated from Spica by $\sim 5^\circ$ (Morning)
23 Fri New Moon (2:17am)
24 Sat The Moon, Venus, and Mercury form a triangle near the SW horizon (Dusk)
26 Mon The crescent Moon is $\sim 5^\circ$ left of Saturn (Dusk)
28-29 Wed- Mercury and Venus are $< 2^\circ$ apart in the SW (Dusk)
29 Thu First-Quarter Moon (5:21pm)
29 Thu The Moon is $\sim 6.5^\circ$ above left of Jupiter (Evening)
29 Thu Algol at minimum brightness for two hours centered on 10:52pm
31 Sat The Moon is located halfway between Mars and Jupiter (Evening)

January

- 1 Sun Algol at minimum brightness for two hours centered on 7:42pm
3 Tue The Moon and Mars are $\sim 2.5^\circ$ apart above Aldebaran (Evening)
4 Wed The Quadrantid meteor shower peaks (Morning)
6 Fri Full Moon (3:08pm)
6 Fri The Moon, Castor, and Pollux form a triangle in the east (Evening)
10 Tue The Moon is $\sim 4^\circ$ from Regulus (Dawn)
14 Sat Last-Quarter Moon (6:10pm)
15 Sun The Moon is $\sim 6^\circ$ left of Spica (Dawn)
18 Wed The Moon and Antares rise together, separated by $\sim 1.5^\circ$ (Dawn)
21 Sat New Moon (12:53pm)
22 Sun Venus and Saturn are separated by 0.5° in the WSW (Dusk)
22 Sun Algol at minimum brightness for two hours centered on 9:27pm
25 Wed The Moon is $\sim 3^\circ$ below Jupiter (Evening)
28 Sat First-Quarter Moon (7:19am)
28 Sat The Moon is between Mars and Jupiter, with Venus and Saturn closer to the horizon in the WSW (Dusk)
30 Mon High in the SW, the Moon is within 0.5° of Mars (Evening)

NASA Night Sky Notes



Binoculars: A Great First Telescope

By David Prosper

Do you want to peer deeper into the night sky? Are you feeling the urge to buy a telescope? There are so many options for budding astronomers that choosing one can be overwhelming. A first telescope should be easy to use and provide good quality views while being affordable. As it turns out, those requirements make the first telescope of choice for many stargazers something unexpected: a good pair of binoculars!

Binoculars are an excellent first instrument because they are generally easy to use and more versatile than most telescopes. Binoculars can be used for activities like stargazing and birdwatching, and work great in the field at a star party, along the hiking trail, and anywhere else where you can see the sky. Binoculars also travel well, since they easily fit into carry-on luggage – a difficult feat for most telescopes! A good pair of binoculars, ranging in specifications from 7x35 to 10x50, will give you great views of the Moon, large open star clusters like the Pleiades (M45), and, from dark skies, larger bright galaxies like the Andromeda Galaxy (M31) and large nebulae like the Orion Nebula (M42). While you likely won't be able to see Saturn's rings, as you practice your observing skills you may be able to spot Jupiter's moons, along with some globular clusters and fainter nebulae from dark sites, too.

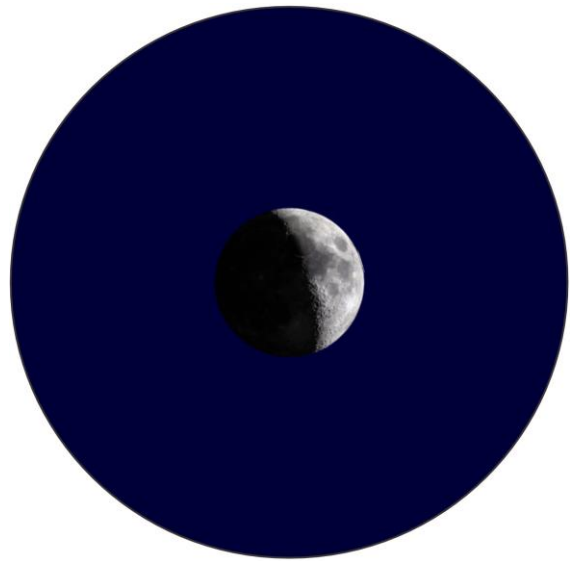


Caption: The two most popular types of binocular designs are shown here: roof-prism binoculars (left) and porro-prism binoculars (right). Roof prisms tend to be more compact, lighter, and a bit more portable, while porro-prisms tend to be heavier but often offer wider views and greater magnification. What should you choose? Many birders and frequent fliers often choose roof-prism models for their portability. Many observers who prefer to observe fainter deep-sky objects or who use a tripod with their observing choose larger porro-prism designs. There is no right answer, so if you can, try out both designs and see which works better for you.

What do the numbers on those binocular specs actually mean? The first number is the magnification, while the second number is the size in millimeters (mm) of the lenses. So, a 7x35 pair of binoculars means that they will magnify 7 times using lenses 35 mm in diameter. It can be tempting to get the biggest

binoculars you can find, but try not to get anything much more powerful than a 10x50 pair at first. Larger binoculars with more power often have narrower fields of vision and are heavier; while technically more powerful, they are also more difficult to hold steadily in your hands and "jiggle" quite a bit unless you buy much more expensive binoculars with image stabilization, or mount them to a tripod.

Would it surprise you that amazing views of some astronomical objects can be found not just from giant telescopes, but also from seemingly humble binoculars? Binoculars are able to show a much larger field of view of the sky compared to most telescopes. For example, most telescopes are unable to keep the entirety of the Pleiades or Andromeda Galaxy entirely inside the view of most eyepieces. Binoculars are also a great investment for more advanced observing, as later on they are useful for hunting down objects to then observe in more detail with a telescope.



Caption: A pair of good binoculars can show craters on the Moon around 6 miles (10 km) across and larger. How large is that? It would take you about two hours to hike across a similar-sized crater on Earth. The "Can You See the Flag On the Moon?" handout showcases the levels of detail that different instruments can typically observe on the Moon, available at bit.ly/flagmoon. Moon image courtesy Jay Tanner

If you are able to do so, real-world advice and experience is still the best for something you will be spending a lot of time with! Going to an in-person star party hosted by a local club is a great way to get familiar with telescopes and binoculars of all kinds – just ask permission before taking a closer look! You can find clubs and star parties near you on the Night Sky Network's Clubs & Events page at bit.ly/nsnclubsandevents, and inspire your binocular stargazing sessions with NASA's latest discoveries at nasa.gov.

This article is distributed by the NASA Night Sky Network, a coalition of hundreds of astronomy clubs across the US dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, stargazing info and more.



Tri-Valley Stargazers
P.O. Box 2476
Livermore, CA 94551
www.trivalleystargazers.org

Tri-Valley Stargazers Membership Application

Contact information:

Name: _____ Phone: _____

Street Address: _____

City, State, Zip: _____

Email Address: _____

Status (select one): _____ New member _____ Renewing or returning member

Membership category (select one): Membership term is for one calendar year, January through December.

_____ Student member (\$10). Must be a full-time high-school or college student.

_____ Regular member (\$30).

Hidden Hill Observatory Access (optional): Must be 18 or older.

_____ One-time key deposit (\$20). This is a refundable deposit for a key to H2O. New key holders must first hear an orientation lecture and sign a usage agreement form before using the observing site.

_____ Annual access fee (\$10). You must also be a key holder to access the site.

Donation (optional):

_____ Tax-deductible contribution to Tri-Valley Stargazers

Total enclosed: \$ _____

Member agrees to hold Tri-Valley Stargazers, and any cooperating organizations or landowners, harmless from all claims of liability for any injury or loss sustained at a TVS function. TVS will not share information with anyone except as detailed in our Privacy Policy (<http://www.trivalleystargazers.org/privacy.shtml>).

Mail this completed form along with a check to: Tri-Valley Stargazers, P.O. Box 2476, Livermore, CA 94551.